

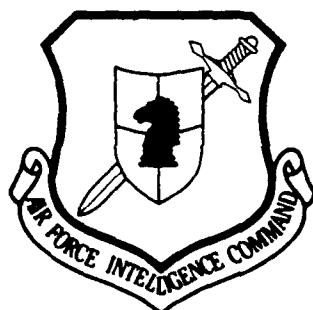
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THE WEAPON RESEARCH CONTRACT SYSTEM IN CHINA

by

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The Weapon Research Contract System in China

Hou, Yuen

Abstract The weapon research contract system in China is introduced. Suggestions with regard to better improve the current system were also made.

Ever since the New China was established, the research and development of weapon systems slowly transformed from imitation to indigenous and independent development. The major weapon systems currently used by PLA, from highly advanced to regular weapon systems such as guided missiles, aircraft, warships, and tanks, are basically all developed and manufactured in China, which should be regarded as a major achievement of the modernization of Chinese defense power. Improving the organization and management of weapon research system not only expedite the process of weapon research, it also helps in escalating the level of defense technology. The contract system in weapon research is one of the most important improvement measures in defense technology after the policy of opening was set by the government. Positive improvements in the coordination of industry (research and development) and military (actual user), diminishing of possible conflicts between needs and reality, and efficiency of research funding and quality of weapon research is already evident.

The necessity of weapon research contract system

The concept that weapon is a specialized merchandise has been slowly understood and accepted by most people. During the period of Korean War, the weapons manufactured by industry were given to the troops while the Department of Finance paid the industry directly. Along with the development of civil economy, a verification and auditing system was slowly established between the military and industry and the military merchandise was correctly priced and paid for by the military branch. However, weapon research has been following the same system where the military branch provided the weapon verification, experience with new weapon systems and tactical target, and carried out design and test; while the weapon research funding was directly given to defense technology industry, which was also given the responsibility of organizing and managing the research process. Because of the potential differences between weapon requirements set by the military branch and the actual industrial and financial capability, some of the funding and time was wasted, which also explained the low overall efficiency in defense technology. Therefore, introduction of the planned merchandise economy into the realm of weapon research and combination of administration, economy, and legal measures have become a major task for improving management of weapon research. Since 1987, weapon research contract system has been widely applied. Weapon system regulation and research funding was directly appropriated to the user of the system. The user then negotiated contracts

th industry or institute (defense technology research institute, higher education institute, or private corporations). Under the condition of coordination and fairness, the responsibility, right, and profit are clearly defined and the research funding was effectively appropriated.

. The characteristics of weapon research contract system in China

Specific implementable procedures of weapon research contract system were developed after a few years of experience. Currently, the research contracts between military user and defense industry can be divided into case research period, engineering research period, and design and manufacturing period. In other words, the contracts were signed from the initiation and analization of research topic to the completion of design. For research topics with complex technology, long-term research period, and complicated coordination, the contracts will be divided into principle study, preliminary research, and full-scale research and manufacturing contracts. Generally, the user will sign the contract with a general contractor while the general contractor will be responsible for signing the contracts with sub-contractors. As a result, a multi-layered contract network is formed. The major characteristics of a research contract are:

1. The guiding role of weapon users in research and development of weapon systems is emphasized

Military branch is the direct user of weapon systems. Based

the national security requirement and possible future combat missions, the research goal of weapon systems is determined. After the weapon research contract system is implemented, more responsibility is placed on the end user who will be the first group to propose the reasonable tactical technology indicator to be used as the basis for weapon research and negotiation of the contract. Based on the concept of weapon development planning and available research resources, the research topics are prioritized and research emphasis and direction is established. The limited resources will be used on the most urgent items so that the problem of carrying out research items without considering funding condition is avoided.

2. Combination of instructional planning and economical means

A certain competition mechanism is introduced after implementing the research contract system. However, the competition is under the guidance of relevant national policies. The weapon research and development planning guidelines, which must not be altered or canceled by research institutes, are obeyed and the tactical technology indicators and overall research plan, which lists the relevant regulations of weapon research and development, are followed. Using economic measures, the contract clearly defines the profit and bonus of the research group, properly appropriates the surbodination and sharing of technical achievement, and regulates the punishment or fine for any party violating the terms in the contract. Therefore, through proper

lection of research group and reasonable appropriation and
ving of funding, the research mission can be accomplished with
arantee in quality and quantity.

3. Close coordination between user and industry

No matter it is the contract bidding process or the
gotiating or contract fulfillment process, the mutual support,
ordination, and sharing of responsibility between the miliary
anch and defense industry is of utmost importance and only a
ose relationship between the two parties could guarantee the
accomplishment of the research mission. When argument arises
uring test or verification of the product, the mutual
nderstanding and support is especially crucial. The user group
ould continuously trace and understand the research
evelopment, unbiasedly verified the research quality (especially
e technical results), strongly support the mutual independence
f the administration commanding and design systems, and provide
mely advises and suggestions. The defense industry should
plement its military merchandise management mechanism and
lministration experience to establish the design, administration
ommanding, and quality assurance systems for various weapon
egulations, and progressively adopt the relevant coping measures
th respect to weapon research.

II. Comparison with weapon research contract system of the estern nations

The weapon research contract system has been implemented in

he Western nations for a long time. During the first World War, he US armed forces started the contract system which has become, hough many years of development, a ry complete system. Presently, weapon research and military merchandise purchasing contract system is implemented in nations such as the United States, Great Britain, France, and Germany. Contract management centers are set up in the Department of Defense and all the military branches of the United States and a series of regulations regarding legal requirement, bidding procedure, verification, and contract establishment are clearly defined. The guiding concept of the contract system of the US armed forces is to use the ultimate goal of profit of private business as a stimulus to let military branches, the only representatives of the government, actively organize the corporation and competition between the industries to accomplish the mission of fulfilling the contract, the need of developing weapon systems, and reducing the possible loss as a result of contract problems. When the weapon research contract is negotiated, the purchase, training, logistics requirement, and maintenance are also negotiated so that the total management cost can be minimized. The weapon research contracts of the US armed forces can be roughly divided into two categories: fixed price contract and cost compensation contract. Fixed price contract is mainly used in quantity purchasing of military merchandise. Because the price is fixed, the appropriation ratio; the distribution of the difference between the actual cost and projected cost, can be determined

forehand. As a result, the manufacturer is encouraged to reduce the manufacturing cost. However, because of the risk involved in research, certain costs could not be accurately predicted and a different contract, cost compensation contract, is needed. The price of a cost compensation contract is determined by the reasonable profit and the actual cost. Based on the calculated cost, the fixed bonus (and/or evaluated bonus) is added to encourage cost management. After long-term development, research and manufacturing of major weapon systems of the US armed forces is already monopolized by certain industries and the competition can be fierce sometimes. Nevertheless, the overall stability has been achieved. The US armed forces weapon research contracts are classified and categorized. Research items involving major technical breakthrough or large sum of funding (total research funding exceeding 200 million dollars and total purchasing funding exceeding 1 billion dollars) are classified as important national defense purchasing plan which has to be verified by the Secretary of Defense. Because People's Republic of China is a socialist country, weapon research contract system is established based on "People's Republic of China Technical Contract Code" and relevant codes or administrative orders. The major parties of weapon research contract are the social organizations and armed forces, both sharing the raw material and information with one another. This is a fundamental difference between a socialist and capitalist nation. Therefore, the contract system of the western nations can not be blindly imitated even though some

practical management techniques can be adopted.

IV. Future Development of Weapon Research Contract System in China

The weapon research contract system will have to keep improving. Total dedication to higher levels of defense technology is still an important warranty to the success of research contract system. The major future developments are:

1. Establish the relevant regulations and codes regarding cooperation of military branches and industries. Maintain the relative stability of policies. Properly manage the relationship between needs and research based on the principles of supply and demand so that 1) the user group and research group both have a regulation to follow, 2) the common business can be conducted, and 3) the conflicts can be resolved.

2. Keep investigating on the effective format of the contract which complies with the traditional philosophy and the new method of establishing a contract. Specific problem areas include the research funding for solving problems left behind after the product is finalized and the research grant is allotted. Additional funding is always required to completely conclude the research project, resulting in increase in total research cost. At the same time, attention should be paid to the effect of consumer price index on the research cost. Adequately improving the contract management department, especially the

ality of contract managers, the appropriation of funding, and verification of progress and quality will help in resolving the problem of prolonged research cycles.

3. In further promoting the contract system, it is worth considering the importance of removing the blockades between departments and businesses and enlarging and encouraging competition. Ever since the defense technology industry in China has re-structured, many medium to large defense industries are facing the difficult task of "civilization" and the fulfillment of research is heavily dependent on the management of the contractors. Therefore, on the one hand the research and manufacturing capability of national defense technology should be preserved and the professionalism, stability, and continuity of research work should be cautioned to avoid unnecessary or blind competition, on the other hand the technological achievement of any civil industries should be adopted and utilized.

4. An important requirement of weapon research contract system is the development of total-life, total-system management of weapon systems by the user group. Total consideration should be given to technology development, prototype manufacturing, equipment purchasing, training, and logistics operation and maintenance operation. Only when the quantity and purchasing progress are clearly defined can the requirement of research progress specified in the contract and the transferring of research product to manufacturing preparation be solidly based and the military economy efficiency be elevated.

5. One of the necessary requirements for smoothly carrying out weapon research contract system is the accounting/auditing system based on national finance codes. The raw finance data should be properly established by the research group and verification and monitoring of flow of research funding should be carefully executed by relevant departments to avoid possible effect of widening up the range of research purchases and escalating of cost.